Landsat 7 Processing System Acceptance Criteria

September 30, 1996

Earth Resources Observation Systems Data Center
Sioux Falls, South Dakota

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Document TBDs/TBRs/TBSs

Paragraph	Issue	Closure Plan
3.1.4.2 - Support Tools	**TBS - need a list of development systems, test tools, informal diagnostics and checkout scripts, etc. that will be delivered with the LPS at the time of LPS installation**	**NASA GSFC Code 514 to provide support tools list**

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1.0 Introduction

1.1 Purpose

This document identifies the criteria used by the United States Geological Survey (USGS) in determining whether or not to accept operational and support responsibilities for the Landsat 7 Processing System (LPS).

1.2 Scope

This document discusses the general philosophy used to determine LPS acceptance criteria. An incremental acceptance process is defined and acceptance criteria for each increment is stated.

Detailed acceptance criteria will be documented in the USGS EDC LPS Acceptance Test Plan and associated detailed test procedures.

2.0 Acceptance Overview

2.1 Context

The development and operation of the Landsat 7 system is a multi-agency venture. NASA GSFC is responsible for Landsat 7 spacecraft, instrument, and ground system development. NOAA is responsible for Landsat 7 spacecraft and ground system operations. USGS is responsible for Landsat national archive maintenance and data distribution.

A portion of the Landsat 7 ground system will be located at, and operated from, the Earth Resources Observation System (EROS) Data Center. The EROS Data Center (EDC) is a USGS facility located near Sioux Falls, South Dakota. The Landsat 7 Ground Station (LGS), the LPS, and the Image Assessment System (IAS) will be installed at EDC. NOAA has delegated to the USGS the operations and support responsibilities for the three aforementioned Landsat 7 ground system elements. NOAA will fund these USGS activities.

LPS operations and support responsibilities will incrementally transition from NASA GSFC to USGS EDC. NASA GSFC is the LPS developer and as such is initially entirely responsible for LPS operations and support activities. USGS EDC is the on-orbit LPS operations and maintenance provider and as such has minimal initial involvement with the LPS. The USGS EDC will assess the developmental and operational maturity of the LPS at predefined transition points. The USGS EDC will determine whether or not to accept an incrementally increasing portion of the LPS operations and support responsibilities at each transition point. The USGS EDC will accept complete responsibility for LPS operations, maintenance, sustaining engineering, system engineering, and management at the final transition point.

2.2 LPS Transition Events

USGS EDC incremental acceptance of LPS operation and support responsibilities will occur at the following transition events:

1. Consent-To-Ship Review (at GSFC).

2. Site Installation Acceptance Review (at EDC).
3. EDC Launch Readiness Review (at EDC).
4. LPS Final Acceptance Review (at EDC).

2.2.1 Consent To Ship Review

The Consent-To-Ship review (CSR) is the first incremental acceptance transition point. The CSR is held at the completion of LPS Factory Acceptance Test at GSFC. Successful completion of the CSR will result in NASA GSFC shipping the LPS to EDC and proceeding to install and checkout the LPS in its operational configuration. The criteria used to determine shipment readiness is described in Section 3.1.

2.2.2 Site Installation Acceptance Review

The Site Installation Acceptance Review is the second incremental acceptance transition point. The review is held at the completion of the LPS Site Acceptance Test. Successful completion of the review results in USGS EDC accepting responsibility for the following activities:

1. LPS system administration.
2. COTS hardware and software maintenance.
3. COTS hardware and software configuration management.
4. LPS operations.

The criteria used to determine successful completion of the Site Installation Acceptance Review is described in Section 3.2.

2.2.3 EDC Launch Readiness Review

The EDC Launch Readiness Review is the third incremental acceptance transition point. This review occurs at EDC after completion of mission readiness testing, operational readiness testing, and system intersegment testing. This review occurs just prior to the Operational Readiness review (ORR). Successful completion of the review results in USGS EDC accepting responsibility for the following additional activities:

1. LPS software and hardware maintenance (not covered in CSR)
2. LPS software maintenance releases.

NASA GSFC is still responsible for providing NASA GSFC developed hardware, software, and firmware support (as defined in the LPS Transition Plan) at this point.

The criteria used to determine successful completion of the EDC Launch Readiness Review is described in Section 3.3.

2.2.4 LPS Final Acceptance Review

The LPS Final Acceptance Review is the final incremental acceptance transition point. The review occurs at EDC at the completion of Landsat-7 on-orbit testing. The completion of on-orbit testing signifies the end of development activities and the start of mission operations.

Successful completion of this review results in USGS EDC accepting complete responsibility for LPS operations, maintenance, sustaining engineering, system engineering, and management activities. The criteria used to determine successful completion of the LPS Final Acceptance Review is described in Section 3.4.

3.0 Acceptance Criteria

3.1 Consent-To-Ship Acceptance Criteria

The criteria used to assess the suitability of the LPS to be shipped to EDC for permanent installation and subsequent testing is listed in the following paragraphs. The criteria can be grouped into the following areas:

1. System Performance
2. System Configuration
3. Documentation
4. Support Items
5. Training

Meeting the criteria stated is required before shipping the LPS the EDC. Areas of non-compliance shall be documented with a corresponding mutually agreed to work-off plan in place before consent to ship will be given.

3.1.1. System Performance

The LPS must demonstrate compliance with LPS requirements, design specifications, and operational descriptions. Specifically the LPS must demonstrate:

1. Conformance to the functional and performance requirements in Reference 1 and Reference 2
2. Conformance to the interface requirements documented in reference 3 through 7
3. Operability in compliance with Reference 8
4. Functionality, performance, and operability in accordance with the as-built design documentation including Reference 9, Reference 10, and Reference 11.

Specific test methods and acceptance criteria will be provided in the LPS Acceptance Test Plan and associated test procedures. The test plan will be written by USGS EDC personnel. The corresponding test procedure(s) will be written by USGS EDC. The tests will be performed by USGS EDC.

The test plan and procedures developed by USGS EDC may be quite similar to those developed by NASA (or contract staff) as part of NASA's LPS integration and test program. USGS EDC may use NASA LPS test results instead of USGS EDC test results as LPS acceptance criteria if USGS EDC determines that the NASA LPS test plans and procedures are adequate.

Areas of non-compliance with the baselined USGS EDC LPS Acceptance Test Plan and associated test procedures shall be documented with a corresponding mutually agreed to work-off plan in place before consent to ship will be given.

3.1.2. System Configuration

The hardware and software configuration of the LPS shall comply with the as-built configuration specified in the LPS Software Configuration Guide and the LPS Operations and Maintenance Manual. This includes COTS hardware, COTS software, non-COTS hardware/software, and network interconnection.

Areas of non-compliance shall be documented with a corresponding mutually agreed to work-off plan in place before consent to ship will be given.

3.1.3. Documentation

Documentation regarding operations, maintenance, and design of the as-built hardware and software configuration of the LPS shall be provided. Specifically, the following documentation shall be ready for delivery:

1. LPS Users Guide
2. LPS Operations and Maintenance Manual
3. LPS Software Requirements Specification
4. LPS Functional and Performance Specification
5. LPS As-Built Specification
6. LPS Operations Concept
7. LPS Programmers Reference Manual
8. LPS Software Configuration Guide
9. LPS Output files Data Format Control Book

Areas of non-compliance shall be documented with a corresponding mutually agreed to work-off plan in place before consent to ship will be given.

3.1.4. Support Items

3.1.4.1 Spare Parts

The deliverable LPS spare parts and consumables shall be documented in the LPS Operations and Maintenance Manual. The deliverable LPS spare parts and consumable shall be ready for delivery to EDC.

Areas of non-compliance shall be documented with a corresponding mutually agreed to work-off plan in place before consent to ship will be given.

3.1.4.2 Support Tools

The following LPS development systems, test tools and other support hardware/software shall be ready for delivery to EDC:

1. TBS (code 514)

Areas of non-compliance shall be documented with a corresponding mutually agreed to work-off plan in place before consent to ship will be given.

3.1.5. Training

Training activities specified in the Landsat 7 Processing System (LPS) Transition Plan (514-2TP/0195) shall be successfully completed. Specifically, the following training shall be complete prior to LPS factory acceptance test:

1. LPS operations training courses (classroom training).

Areas of non-compliance shall be documented with a corresponding mutually agreed to work-off plan in place before consent to ship will be given.

3.2 Site Installation Acceptance Review

Criteria for successful completion of the Site Installation Acceptance Review include:

1. Successful completion of the testing documented in the USGS EDC LPS Acceptance Test plan and associated test procedures.
2. Successful closure of consent-to-ship review action items (as scheduled during CSR)
3. Verification of receipt of items shipped from GSFC (see Section 3.1)

The LPS Acceptance Test Plan and associated test procedures will be written and performed by USGS EDC personnel.

Areas of non-compliance shall be documented with a corresponding mutually agreed to work-off plan in place before USGS EDC accepts limited LPS O&M responsibilities (see Section 2.2.2)

3.3 EDC Launch Readiness Review

Criteria for successful completion of the EDC Launch Readiness Review include:

1. Successful completion of LPS mission readiness testing.
2. Successful completion of LPS system integration testing.
3. Successful completion of LPS operational readiness testing.
4. Successful completion of the training activities specified in the Landsat 7 Processing System (LPS) Transition Plan (514-2TP/0195)
5. Successful delivery to EDC of copies of the LPS source code, software engineering notebooks, hardware maintenance records, and test summary reports for each LPS software release.
6. Successful closure of open items from CSR, Site Installation Acceptance Review, and any other test activity.

Areas of non-compliance shall be documented with a corresponding mutually agreed to work-off plan in place before USGS EDC accepts further LPS O&M responsibilities (see Section 2.2.3).

3.4 LPS Final Acceptance Review

Criteria for successful completion of the LPS Acceptance Review include:

1. Successful closure of open items from previous LPS acceptance activities.
2. Successful closure of any LPS issues identified during the on-orbit test phase.
3. Successful delivery of any remaining LPS documentation.

Areas of non-compliance shall be documented with a corresponding mutually agreed to work-off plan in place before USGS EDC accepts full LPS O&M responsibilities (see Section 2.2.4).

4.0 Reference Documents

The following documents (of the latest issue) comprise a portion of the LPS acceptance criteria to the extent referenced herein:

1. NASA GSFC, Landsat 7 Processing System (LPS) Functional and Performance Specification, 560-8FPS/0194

2. NASA GSFC, Landsat 7 Processing System (LPS) Software Requirements Specification, 560-8SWR/0195

3. NASA GSFC, Interface Control Document (ICD) between the Landsat 7 Ground Station (LGS) and the Landsat 7 Processing System (LPS), 560-1ICD/0794

4. NASA GSFC, Interface Control Document Between EOSDIS Core System (ECS) and the Landsat 7 System, 209-CD-013-002

5. NASA GSFC, Memo of Understanding (MOU) between the Landsat 7 Processing System and the Mission Operations Center (MOC), May 1995.

6. NASA GSFC, Interface Control Document (ICD) Between the Image Assessment System (IAS) and the Landsat 7 Processing System (LPS), 514-1ICD/0195

7. NASA GSFC, Landsat 7 Processing System (LPS) Output Files Data Format Control Book, 510-3FCD/0195

8. NASA GSFC, Landsat 7 Processing System (LPS) Operations Concept, 560-3OCD/0194

9. NASA GSFC, Landsat 7 Processing System (LPS) User’s Guide, 514-3SUG/0195.

10. NASA GSFC, Landsat 7 Processing System (LPS) Operations and Maintenance Manual, 514-30MM/0196

11. NASA GSFC, Landsat 7 Processing System (LPS) Detailed Design Specification, 514-4DDS/0195

12. NASA GSFC, Landsat 7 Processing System (LPS) Transition Plan, 514-2TP/0195

13. USGS EDC, Landsat 7 Processing System Acceptance Test Plan

14. NASA GSFC, Landsat 7 Processing System Software Configuration Guide